Master Level Beekeeping

Available for 3 undergraduate credits through the University of Montana Division Of Biological Sciences as BIOB 325 Master Level Beekeeping.

Instructors

Dr. Jerry Bromenshenk
Dr. Scott Debnam
Phillip Welch
Guest experts on specific topics

Location

The course is taught online through Moodle, the University of Montana's online learning system.

Prerequisite

Registration for the Master-Level course is open to those who have successfully completed UM's Journeyman-Level Beekeeping Course.

Course Description

The Master course is the third and final level in the Master Beekeeping curriculum. It offers a more detailed look into bee flight, anatomy and reproduction, discusses bee pheromones and genetics, and provides templates for record keeping for improved bee management. The course also covers hive products, bee nutrition, selection of apiary locations, and basic principles for conducting your own experiments. Students will be introduced to use of Excel spreadsheets for research, managerial, and cost accounting applications. By the end of the course, students will have a better understanding of advanced bee management and an introduction to the business of beekeeping. They should be ready to develop and maintain healthy hives for both hobbyist and larger scale endeavors.

The course is equivalent to 45 hours of instruction. Participants should allow 5-7 hours per week for participation in the course, study time, and reading. The course will start with a more traditional approach with weekly exams, but will develop into a more interactive form of assessment as the students become part of the exercise in the Discussion Forums, much like a graduate seminar is conducted.

Required Textbooks

- The Hive and the Honey Bee, Joe Graham Editor, 2015 Revision
  ISBN 978-0-915698-16-5 (Hardcover)

- The Craft of Research, 4th Edition, W.C. Booth, G. G. Colomb, J. M. Williams, et al., 2016
  ISBN-13: 978-0226239736 (Paperback) eBook version also acceptable

Research Project

Each student will be expected to conduct a research project, either individually or as part of a project group. The project can take one of two forms: (1) a Research Question based on knowledge-based sources (e.g., literature, library, internet, relevant and reliable experts) or (2) a Field Study based on data acquired from experimentation. By the end of the course, a 4-5 page written Research Report shall be submitted.

This exercise should follow the approach presented in The Craft of Research. Although the text book is focused on project form (1), the only significant difference between (1) and (2) is the source of the data.

Grading Method

All participants must earn 70% or higher overall to receive a certificate of completion for the course and 4.5 CEUs.

Each week will end with an exam or assigned work will be required from the student to illustrate understanding of the course material. Students are also graded on overall participation in forums.

Activity	**Points**
Overall Forum Participation	500
3 Exams (100 pts each)	300
2 Assignments (100 pts each)	200
Research Project	1000
	2000

Academic credit students will be assigned traditional letter grades using the following scale:

>93%	A
92-90%	A-
89-87%	B+
86-83%	B
82-80%	B-
79-77%	C+
76-73%	C
72-70%	C-
69-67%	D+
66-60%	D
<60%	F

Intellectual Property and Copyright

Academic Honesty

Plagiarism is defined as misrepresenting another's work, words, or ideas as one's own. Be aware that submitting plagiarized work is subject to an academic penalty by the course instructor as described in the UM Student Conduct Code.

Accessibility

This course was designed to be fully accessible and meets the requirements of the University of Montana Electronic and Information Technology Accessibility Policy. The University of Montana assures equal access to instruction. Students with disabilities may request reasonable modifications by contacting an instructor or by calling Student Support Services at 406.243.6495. By "reasonable," the University means that no fundamental alterations of academic standards or retroactive modifications will take place.

Course Schedule

Course schedule is subject to change. Due dates for assignments and exams will be announced in class.

Principles of Research

Instructor will be Jerry Bromenshenk

- Research design
- Research project overview
- The Craft of Research textbook
- Guest Expert, Colin B. Henderson, Ph.D.

Research Assignment Overview

Record Keeping

Instructor will be Scott Debnam

- Introduction to record keeping
- Excel overview
- Excel charts and graphs

Excel Record Keeping Assignment

Honey Bee Anatomy

Read pages 134 - 139 in your textbook
Instructor will be Scott Debnam

- Flight musculature
- The physics of Honey bee flight
- Circulatory System

Honey Bee Anatomy Exam

Reproductive Biology

Read pages 159 - 165 in your textbook
Instructor will be Scott Debnam

- Reproductive behavior
- Biology of the queen reproductive system

Reproductive Biology Exam

Genetics and Races

Read pages 53 – 70 and 203 - 206 in your textbook
Instructors will be Scott Debnam and Phillip Welch

- Overview of genetics terms and concepts
- Honey bee genetics
- Overview of Honey bee races, characteristics, strength and weaknesses

Pheromones

Read pages 311- 342, 317; Figure 5
Instructor will be Scott Debnam

- Overview of pheromone terms and concepts
- Honey bee pheromone distribution
- Specific pheromones and their uses in the colony

Pheromones Assignment

Nutrition

Read pages 237-268 and 371-461 in your textbook
Instructor will be Jerry Bromenshenk

- Nutrition overview
- Supplemental feeding
- Guest Expert, animal nutritionist; Dale A Hill, Ph.D.

Hive Products

Read pages 693 - 697 and 705 - 752 in your textbook
Instructor will be Phillip Welch

- Wax and solar wax melter construction
- Pollen composition and collection methods
- Venom composition and collection methods
- Propolis composition and collection methods
- Honey constituents and taste profiles

Nutrition and Hive Products Exam